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GOWLING, LAFLEUR & HENDERSON LLP  
160 ELGIN STREET  
SUITE 2600  
OTTAWA, ON K1P 1C3  
CANADA

EXAMINER

MEHRA, INDER P

ART UNIT PAPER NUMBER

2666

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/406,837

Applicant(s)

SEDDIGH ET AL.

Examiner

Inder P Mehra

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24, 26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-17, 19, 20, 22-24 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 8, 18 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:  |

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***Response to Amendment***

1. This is in response to an amendment dated 7/05/04 which has been fully considered and made of record. Based on this amendment, claims 1, 7, 11, 15, 17, 20, 22 (amended three times), claims 2-3, 6, 9-10, 13-14, 16, 18, 21, 26 and 28-30 (once), claims 4-5, 8, 12, 19, 23-24 (amended twice), have been amended. Claims 25 and 27 (27 previously added in amendment A) have been cancelled. Claims 1-24, 26, and 28-30 are now pending.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 10-12, 14, 22-23 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton**, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky.

For claims, 1, 11-12, 22, and 28-29, Hamilton discloses, “ a method for error recovery (refer to col. 19 lines 57-67, congestion control and transmission control in a data communication, refer to abstract, col. 1 lines 24-31, col. 31 lines 12-17, comprising :

- a communication link between a transmitter and the receiver being established through a TCP handshake, col. 1 lines 46-53 and col. 8 lines 39-45;
- a communication window set to an initial length (transmission rate), refer to col. 15 lines 30-35 and col. 31 lines 50-51;

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- transmitting data packets from the transmitter to the receiver, abstract (lines 3-4), col. 2 lines 44-48;;
- detecting a missing packet at the receiver, as recited by claims 1, 11-12, and 22, refer to col. 19 lines 57-67 and col. 31 lines 19-23; setting a timer (NAK wait timer is started), refer to col. 19 lines 57-59;
- sending a negative acknowledgment from the receiver to the transmitter for the missing data packet, refer to col. 13 lines 23-24, col. 31 line 65 and col. 32 lines 29-34;
- where the missing packet is not received at the receiver in response to the negative acknowledgment before expiry of missing –packet timer, sending a further negative acknowledgment, recited by claim 23, refer to col. 20 lines 10-11;
- decreasing at the transmitter, the length of the congestion window in response to receipt of negative acknowledgment, refer to col. 16 lines 20-37;
- re-transmitting the missing packet. Refer to col. 3 line 60, col. 14 lines 13-18.

Kadanskiy discloses “NACK for missing packets only”, refer to col. 1 line 65 through col. 2 line 16 (An example of a reliable unicast protocol is the well known TCP/IP protocol).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of using NACKs, as taught by Kadansky. The NACKs are integrated (combined) into the receiver. The suggestion/motivation to do so would have been to ensure the re-transmission of packets by sender to receiver.

For claim 10, Hamilton discloses, in reference to fig. 1, the data communications network

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is an internet, refer to col. 6 line67.

For claim 14, Hamilton discloses missing packet received within designated time and the timer value being reset (the missing packet timer is cleared upon receipt of the missing packet at the receiver), refer to col. 24 lines 32-33.

For claim 23, Hamilton discloses NACK timer 152 (missing-packet timer) upon the expiry of which a final negative acknowledgment is sent to the transmitter, refer to col. 20 lines 10-11.

4. Claims 2, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton** as applied to claims 1, 11 and 22 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Sen et al** (US Patent No.6,208,620), hereinafter, Sen.

For claims 2, 9 and 13, Hamilton and Kadansky disclose all the limitations of a subject matter in claims 1 and 11, as mentioned in paragraph 4 above, with the exception of the limitation, "wherein up to four duplicate negative acknowledgments are sent from the receiver", as recited in claims 2, 9 and 13;

Sen discloses radio link protocol (RLP) three NACKS and continues until N attempts have been made (up to four--- NACKS are sent), refer to col. 5 lines 4-5.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of increasing multiplicity of NACKs, as taught by Sen. The

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NACKs are integrated (combined) into the receiver. The suggestion/motivation to do so would have been to ensure the re-transmission of packets by sender to receiver.

5. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton** as applied to claims 1, 11 and 22 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Gersht et al** (US Patent No. 6,405,257), hereinafter, Gersht.

For claims 3, Hamilton and Kadansky disclose all the limitations of a subject matter in claims 1, as mentioned in paragraph 4 above, with the exception of the limitation, “wherein the congestion window is halved at step v of claim 1 (decreasing the length of congestion window in response to the negative acknowledgment)”; Hamilton discloses, “reducing the transmission rate in response to Nack rates being high, refer to col. 16 lines 20-37;

Gersht discloses reduces the congestion window size by half each time source node receives a congestion indicator (wherein the congestion window is halved), refer to col. 35-43;

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of reducing the size of window to half in response to NACK. The NACKs are integrated (combined) into the receiver, whereas the size of window is combined with the transmitter or sender. The suggestion/motivation to do so would have been to avoid congestion.

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6. Claims 4-6, 15-16, 19, and 30, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton**, as applied to claims 1, 11 and 22 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, **Kadansky**, and in view of **Kumar** (US Patent No. 6,269,080).

For claims 4-6, 15-16, and 30, Hamilton and Kadansky disclose all the features of the subjectmatter and claim limitations of claim 15 with the exception of the limitation, "setting a round-trip timer at the transmitter upon sending the packet ; determining the round-trip time, recited by claim 16, and "increasing the congestion window if no negative acknowledgment for the missing packet is received before expiry of the round trip timer"; and congestion window is doubled, as recited by claim 6;

Kumar discloses setting a round-trip timer at the transmitter upon sending the packet, as recited by claims 4 and 15; and "increasing the congestion window if no negative acknowledgment for the missing packet is received before expiry of the round trip timer, as recited by claims 5 and 15, fig. 12 B steps 1252 and 1257, and col. 14 lines 8-14 and col. 14 lines 33-37; determining the round trip time ( $T_{sub.2}$ ), refer to col. 9 lines 60-62, and congestion window is doubled, as recited by claim 6, refer to col. 14 lines 33-36;

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of increasing the time of window (timer). The round trip timer can be implemented by combining the timer in the sender 108 of network 104 as taught by Hamilton , refer to fig. 6. The suggestion/motivation to do so would have been to increase the duration of the round-trip timer to wait for Nack resulting in less traffic of NACKs in the network.

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For claim 19, Hamilton discloses, increasing the congestion window includes the step of multiplicatively increasing the congestion window if no negative acknowledgment for the missing packet is received before the expiry of the round trip timer, col. 16 lines 20-37.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton**, as applied to claims 1, 11 and 22 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Natarajan et al** (US Patent No. 6,538,988), hereinafter, Natarajan.

For claim 7, Hamilton and Kadansky disclose all the features of subject matter and limitations of claim 7, including re-transmitting the missing packet. refer to Hamilton's col. 3 line 60, col. 14 lines 13-18, with the exception of, "*sending a keep-alive request from the transmitter to the receiver, and setting---- time-out timer to detect a---- time-out, responsive to keep-alive request;*

Natarajan discloses, in reference to figs. 1 and 2, *sending a keep-alive request 231 from the transmitter to the receiver, and setting-----a time-out timer 223 to detect a re-transmission time-out, ; responsive to keep-alive request 232*; step 243 of fig. 2, refer to col.5 line 21, col. 5 lines 25-27 and col. 3 lines 34-67 and col. 8 lines 38-41, col. 10 lines 15-20 ;

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of sending keep-alive request message and also setting time-out timer from sender to receiver. The time-out timer, which is located (combined) at the sender, is initiated by the sender at the time of sending keep-alive request message to receiver. The



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suggestion/motivation to do so would have been to test the status of communication between sender and receiver in order to avoid congestion in the network.

8. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton**, in view of **Kumar**, as applied to claims 4, 6 and 15 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Dudley et al** (US Patent (5,754,754), hereinafter, Dudley.

For claim 17, Hamilton, Kumar and Kadansky disclose all the features and limitations of subject matter of invention in the claim 17 with the exception of, “the step of sending a round trip time update request to the receiver”. Hamilton discloses the receiver being responsive to the missing packet, refer to col. 15 lines 4-5; and “*timers be set based on update requests generated by every node*”, refer to col. 2 lines 60-63;

Dudley discloses the step of sending a round trip time update request to the receiver, refer to col. 9 lines 22-36;

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of sending a round-trip time update request to the receiver as taught by Dudley. The round trip timer which is located (combined) at the sender. The suggestion/motivation to do so would have been to determine the time of round-trip communication between sender and receiver in order to avoid congestion in the network.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton**, and further in view of **Kumar** (US Patent No. 6,269,080), as applied to claims 4-6 and 15 above, in

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view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Natarajan et al** (US Patent No. 6,538,988), hereinafter, Natarajan.

For claim 20, both Hamilton and Kumar and Kadansky disclose all the features of subject matter and limitations of claim 20, including re-transmitting the missing packet. refer to Hamilton's col. 3 line 60, col. 14 lines 13-18, with the exception of, "*sending a keep-alive request from the transmitter to the receiver, and setting---- time-out timer to detect a---- time-out, responsive to keep-alive request;*

Natarajan discloses, in reference to figs. 1 and 2, *sending a keep-alive request 231 from the transmitter to the receiver, and setting-----a time-out timer 223 to detect a re-transmission time-out, ; responsive to keep-alive request 232;* refer to col.5 line 21 and col. 3 lines 34-67 and col. 8 lines 38-41, col. 10 lines 15-20 ;

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of sending keep-alive request message and also setting time-out timer from sender to receiver. The time-out timer is located (combined) at the sending and initiated by the sender at the time of sending keep-alive request message to receiver. The suggestion/motivation to do so would have been to test the status of communication between sender and receiver in order to avoid congestion in the network.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hamilton** as applied to claims 1, 11 and 22 above, in view of **Kadansky et al** (US Patent No. 6,507,562), hereinafter, Kadansky, and further in view of **Chien et al** (US Patent No. 5,815,667), hereinafter, Chien.

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For claim 24, Hamilton and Kadansky disclose all the features of the subject matter of the invention in claim 24 dependent upon claims 22, as applied to claims 1, 11 and 22 above with the exception of the limitation, “*the means for adjusting responding to expiry of the re-transmission time-out timer*”;

Chien discloses modify the time-out function after time-out and re-transmission (*the means for adjusting responding to expiry of the re-transmission time-out timer*), refer to col. 6 lines 40-55.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the capability of modifying the time-out function after time-out and re-transmission. The time-out timer is located (combined) at the sending and initiated by the sender at the time of re-transmission of message to receiver. The suggestion/motivation to do so would have been to improve the efficiency of the data packet transference between sender and receiver in order to avoid congestion in the network.

#### ***Allowable Subject Matter***

11. Claims 8, 18, 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 26 is allowed.

*Response to Arguments*

13. Applicant's arguments filed with respect to claims 1-24, 26, and 28-30 have been fully considered but they are not persuasive.

Following are the arguments and responses as detailed in FINAL office action and additional argument in current response by applicant, as follows:

Applicant argues that Hamilton does not disclose reducing acknowledgement traffic generated by TCP, and that Hamilton neither discloses nor suggests reducing acknowledgement traffic generated by TCP. Hamilton neither discloses nor suggests that a transmitter and a receiver communicate with each other using TCP.

In response, it is stated that Hamilton discloses a communication link between a transmitter and the receiver being established through a TCP handshake, col. 1 lines 24-31, col. 31 lines 12-17. Further, TCP is commonly used transport protocol in flow control, as mentioned by applicant in "the admitted prior art" of this instant application, refer to pages 1 and 2.

Applicant argues that Hamilton does not disclose that a receiver is unresponsive to any packets from the transmitter unless the receiver detects the missing packet, as recited in claims 1, 11, and 22.

In response, it is stated that Hamilton discloses, "NACk for missing packets only", refer to col. 20 lines 50-52, col. 13 lines 23-24. However, Kadanski also discloses "NACk for missing packets only", refer to col. 1 line 65 through col. 2 line 16.

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Applicant argues that Hamilton does not disclose nor suggests adjusting a TCP congestion window in response to receipt of the negative acknowledgement, and expiry of the round trip timer as recited in claim 22.

In response, it is stated that Hamilton discloses pacing algorithm adjusting the transmission rate (window adjustment), refer to col. 16 lines 25-30.

Applicant argues that Hamilton does not disclose that a receiver is responsive to only to missing packets and keep alive request , as recited in claim 20.

In response, it is stated that Hamilton discloses, "NACk for missing packets only", refer to col. 20 lines 50-52, col. 13 lines 23-24. Further, Natrajan discloses, "responsive to the keep-alive REQUEST message", refer to col. 5 lines 20-30, col. 3 lines 34-67, col. 8 lines 38-41 and col. 10 lines 15-20.

Applicant argues that Chien does not disclose nor suggests means for adjusting a TCP congestion window in response to receipt of the NACK-----time-out timer, as recited in claim 24.

In response, it is stated that Chien discloses the means for adjusting responding to expiry of re-transmission time-out timer (**changing threshold for improved efficiency of data packet transference**), refer to col. 6 lines 40-55.

**In light of above explanation, Applicant's arguments are not persuasive.**

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14. Applicant's amendment, refer to applicant's response (Remarks) page 11, necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### ***Conclusion***

15. Any enquiry concerning this communication should be directed to Inder Mehra whose telephone number is (703) 305-1985. The examiner can be normally reached on Monday through Friday from 8:30AM to 5:00 PM.

If attempt to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Seema Rao , can be reached on (703) 308-5463. Any enquiry of a general nature of relating to the status of this application or processing should be directed to the group receptionist whose telephone number is (703) 305-4700.

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16. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, DC. 20231

Or faxed to (703) 872-9314.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive,  
Arlington, VA, sixth floor (Receptionist).

*Inder Pal Mehra*  
Inder Mehra

11/4/04

*PM*  
DINGEN  
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